

Unit 2

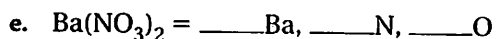
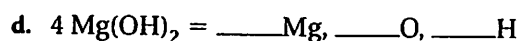
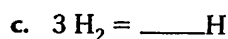
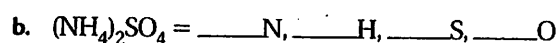
Quick Review
for counting atoms

C.1 SUPPLEMENT: KEEPING TRACK OF ATOMS

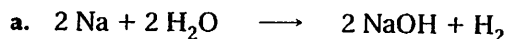
Fill-in-the-Blanks

1. A chemical equation is balanced if there are _____ of each kind of _____ on both sides of the equation.

2. Before looking at equations, determine the number of atoms of each kind in each of the following:

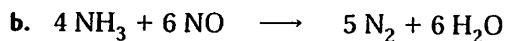


3. Now look at the equations. Count the number of atoms of each kind on each side of the following and determine if the statement is a balanced equation.



<u>Reactants</u>		<u>Products</u>
_____	Na	_____
_____	H	_____
_____	O	_____

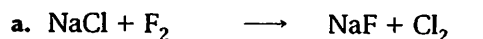
Balanced? Yes _____ No _____



<u>Reactants</u>		<u>Products</u>
_____	N	_____
_____	H	_____
_____	O	_____

Balanced? Yes _____ No _____

4. For each of the following, show the number of each type of atom on each side of the reaction. Decide if the chemical equation is balanced or not.



_____	Na	_____
_____	Cl	_____
_____	F	_____

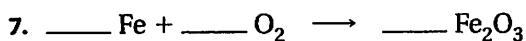
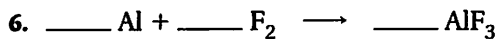
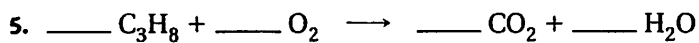
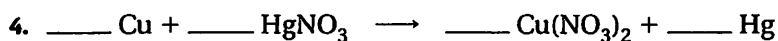
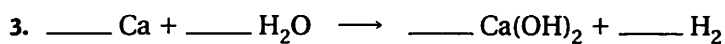
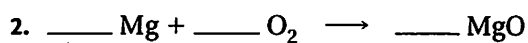
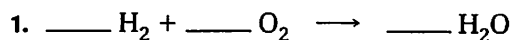
Balanced? Yes _____ No _____

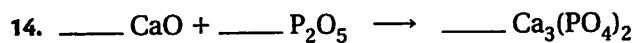
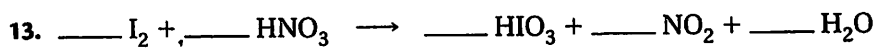
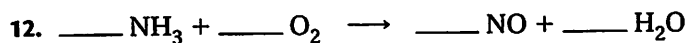
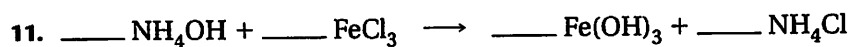
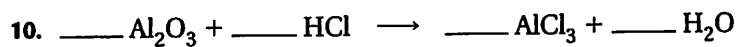
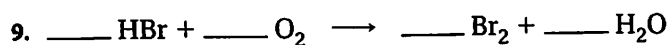
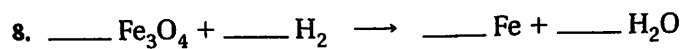
Unit 2

Remember: work L \rightarrow R
Balance H + O last
treat polyatomics
as 1. thing.

C.2 SUPPLEMENT: BALANCING EQUATIONS

Balance the following equations.





BALANCING CHEMICAL EQUATIONS

Name _____

Rewrite and balance the equations below.

1. $\text{N}_2 + \text{H}_2 \rightarrow \text{NH}_3$ _____
2. $\text{KClO}_3 \rightarrow \text{KCl} + \text{O}_2$ _____
3. $\text{NaCl} + \text{F}_2 \rightarrow \text{NaF} + \text{Cl}_2$ _____
4. $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}$ _____
5. $\text{AgNO}_3 + \text{MgCl}_2 \rightarrow \text{AgCl} + \text{Mg}(\text{NO}_3)_2$ _____
6. $\text{AlBr}_3 + \text{K}_2\text{SO}_4 \rightarrow \text{KBr} + \text{Al}_2(\text{SO}_4)_3$ _____
7. $\text{CH}_4 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$ _____
8. $\text{C}_3\text{H}_8 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$ _____
9. $\text{C}_8\text{H}_{18} + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$ _____
10. $\text{FeCl}_3 + \text{NaOH} \rightarrow \text{Fe}(\text{OH})_3 + \text{NaCl}$ _____
11. $\text{P} + \text{O}_2 \rightarrow \text{P}_2\text{O}_5$ _____
12. $\text{Na} + \text{H}_2\text{O} \rightarrow \text{NaOH} + \text{H}_2$ _____
13. $\text{Ag}_2\text{O} \rightarrow \text{Ag} + \text{O}_2$ _____
14. $\text{S}_8 + \text{O}_2 \rightarrow \text{SO}_3$ _____
15. $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2$ _____
16. $\text{K} + \text{MgBr}_2 \rightarrow \text{KBr} + \text{Mg}$ _____
17. $\text{HCl} + \text{CaCO}_3 \rightarrow \text{CaCl}_2 + \text{H}_2\text{O} + \text{CO}_2$ _____

WORD EQUATIONS

Name _____

Write the word equations below as chemical equations and balance.

1. zinc + lead (II) nitrate yield zinc nitrate + lead

2. aluminum bromide + chlorine yield aluminum chloride + bromine

3. sodium phosphate + calcium chloride yield calcium phosphate + sodium chloride

4. potassium chlorate when heated yields potassium chloride + oxygen gas

5. aluminum + hydrochloric acid yield aluminum chloride + hydrogen gas

6. calcium hydroxide + phosphoric acid yield calcium phosphate + water

7. copper + sulfuric acid yield copper (II) sulfate + water + sulfur dioxide

8. hydrogen + nitrogen monoxide yield water + nitrogen

WORD EQUATIONS

NAME: _____

Write the word equations below as chemical equations and balance.

1 sodium chloride and sulfuric acid yield sodium hydrogen sulfate and hydrochloric acid

2 silver nitrate and copper yield copper (II) nitrate and silver

3 hydrogen and nitrogen yield ammonia

4 ammonium nitrate yields nitrogen and hydrogen and oxygen

5 sodium chromate and lead (II) acetate yield sodium acetate and lead (II) chromate

6 ammonia and oxygen yield nitric acid and water

7 magnesium and nitric acid yield magnesium nitrate and hydrogen

8 mercury (I) chloride yields mercury and mercury (II) chloride

9 sodium bicarbonate and sulfuric acid yield sodium sulfate and carbon dioxide and water

10 butane (C_4H_{10}) and oxygen yield carbon dioxide and water

11 carbon dioxide and calcium hydroxide yields calcium carbonate and water

12 carbon monoxide and oxygen yields carbon dioxide

Name _____ Date _____ Class _____

8-2 Practice Problems

1. Write the formula equation for the following reaction: Ammonia reacts with hydrogen chloride to form ammonium chloride.
2. When heated, calcium carbonate (CaCO_3) decomposes to form calcium oxide and carbon dioxide. Write an equation for this reaction.
3. Write the formula equation for the following reaction: Barium oxide (BaO) reacts with water to form barium hydroxide.
4. Acetaldehyde (CH_3CHO) decomposes to form methane (CH_4) and carbon monoxide. Write an equation for this reaction.
5. Write the formula equation for the following reaction: Zinc reacts with copper(II) nitrate ($\text{Cu}(\text{NO}_3)_2$) to form zinc nitrate and copper.
6. When heated, calcium sulfite (CaSO_3) decomposes to form calcium oxide and sulfur dioxide. Write an equation for this reaction.
7. Write the formula equation for the following reaction: Iron reacts with sulfuric acid (H_2SO_4) to form iron(II) sulfate (FeSO_4) and hydrogen gas.
8. Azomethane ($\text{C}_2\text{H}_6\text{N}_2$) decomposes to form ethane (C_2H_6) and nitrogen gas at 297°C . Write an equation for this reaction.
9. Write out the formula equation for the following reaction: Carbon monoxide reacts with chlorine gas to form phosgene (COCl_2).
10. Manganese(II) iodide decomposes when exposed to light to form manganese and iodine. Write an equation for this reaction.

Name _____ Date _____ Class _____

8-2 Practice Problems (continued)

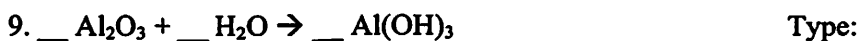
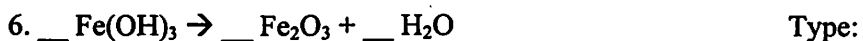
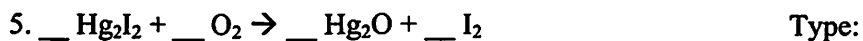
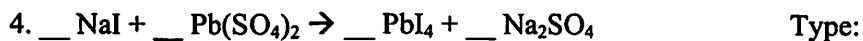
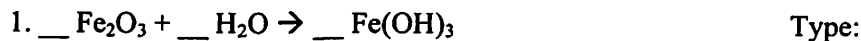
11. Write a balanced chemical equation for the reaction in which dinitrogen pentoxide (N_2O_5) reacts with water to produce nitric acid (HNO_3).
12. Magnesium reacts with titanium(IV) chloride (TiCl_4) to produce magnesium dichloride (MgCl_2) and titanium. Write the balanced equation for this reaction.
13. Write a balanced chemical equation for the reaction in which carbon reacts with zinc oxide to produce zinc and carbon dioxide.
14. Bromine reacts with sodium iodide to form sodium bromide and iodine. Write the balanced equation for this reaction.
15. Write a balanced chemical equation for the reaction in which phosphorus trichloride (PCl_3) reacts with chlorine gas to produce phosphorus pentachloride (PCl_5).
16. Phosphorus reacts with bromine to produce phosphorus tribromide (PBr_3). Write the balanced equation for this reaction.
17. Calcium hydride (CaH_2) reacts with water to produce calcium hydroxide (Ca(OH)_2) and hydrogen gas. Write the balanced equation for this reaction.
18. Write a balanced chemical equation for the reaction in which sulfuric acid (H_2SO_4) reacts with potassium hydroxide to produce dipotassium sulfate (K_2SO_4) and water.
19. Write a balanced chemical equation for the reaction in which propane (C_3H_8) reacts with oxygen gas to produce carbon dioxide and water.
20. Benzene (C_6H_6) reacts with oxygen gas to produce carbon dioxide and water. Write the balanced equation for this reaction.

Name _____
Chemistry AE
Chapter 8 Review Packet

Date _____

Use your ion sheet to help you complete the following questions. Remember that on the test, your ion sheet will not include the following ions: phosphate, nitrate, sulfate, hydroxide, ammonium, or carbonate. It will also be missing monatomic ions (ions formed from single elements) which can be determined using a period table. (Group 1 = 1+, Group 2 = 2+, Group 13 = 3+, Group 15 = 3-, Group 16 = 2-, Group 17 = 1-)

Balance the following equations and write the type of reaction.



Write a balanced equation from the word equation given. Write the type of each reaction.

1. Barium Chloride + Silver Nitrate \rightarrow Barium Nitrate + Silver Chloride

2. Sodium + Iron (II) Chloride \rightarrow Iron + Sodium Chloride

3. Magnesium Hydroxide + Sulfuric Acid \rightarrow Sodium Hydroxide + Water

4. Calcium Carbonate \rightarrow Calcium Oxide + Carbon Dioxide

5. Pentane (C₅H₁₂) + Oxygen \rightarrow Carbon Dioxide + Water

6. Aluminum + Iron (II) Nitrate \rightarrow Aluminum Nitrate + Iron

7. Water + Sulfur Trioxide \rightarrow Sulfuric Acid

8. C₃H₈ + Oxygen \rightarrow Carbon Dioxide + Water

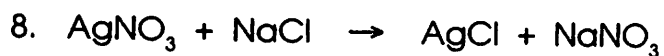
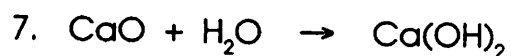
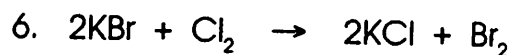
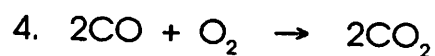
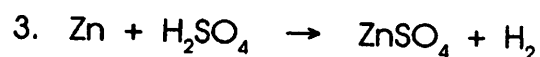
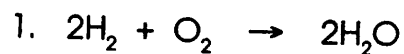
9. Sodium Carbonate + Potassium Phosphate \rightarrow Sodium Phosphate + Potassium Carbonate

10. Lithium Oxide + Water \rightarrow Lithium Hydroxide

CLASSIFICATION OF CHEMICAL REACTIONS

Name _____

Classify the reactions below as synthesis, decomposition, single replacement (cationic or anionic) or double replacement.



Word Equations

1. iron (II) chloride + silver oxalate yields iron (II) oxalate + silver chloride
2. mercury (I) sulfate + lithium carbonate yields mercury (I) carbonate + lithium sulfate
3. magnesium metal + copper (II) oxide yields magnesium oxide + copper metal
4. nickel metal + copper (II) chloride yields nickel (II) chloride + copper metal
5. lithium chlorate when heated yields lithium chloride and oxygen gas
6. magnesium chloride + silver perchlorate yields magnesium perchlorate + silver chloride
7. aluminum sulfate + sodium chlorite yields aluminum chlorite + sodium sulfate
8. tin metal + lead (IV) hydroxide yields stannous hydroxide + lead metal
9. sodium metal + lead (II) chloride yields sodium chloride + lead metal
10. iron (III) acetate + beryllium sulfide yields iron (III) sulfide + beryllium acetate